

Solve for x

$$\begin{aligned} \textcircled{1} \quad x^2 &= -6x - 8 \\ &\quad +6x \quad +8 \\ x^2 + 6x + 8 &= 0 \\ (x+4)(x+2) &= 0 \\ \boxed{x = -4, -2} \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad x^2 - 3x &= 18 \\ &\quad -18 \\ x^2 - 3x - 18 &= 0 \\ (x-6)(x+3) &= 0 \\ \boxed{x = 6, -3} \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad \sqrt[3]{x+5} &= \frac{6}{3} \\ \sqrt[3]{x+5} &= 2 \\ (\sqrt[3]{x+5})^3 &= 2^3 \\ x+5 &= 8 \\ x+5 &= 8 \\ -5 \quad -5 \\ \boxed{x = 3} \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad 4(x+2)^{\frac{3}{2}} &= 108 \\ \frac{4}{4} (x+2)^{\frac{3}{2}} &= \frac{108}{4} \\ (x+2)^{\frac{3}{2}} &= 27 \\ x+2 &= 27^{\frac{2}{3}} \\ x+2 &= (3\sqrt[3]{27})^2 \\ x+2 &= 9 \\ \boxed{x = 7} \end{aligned}$$

Expand

$$\begin{aligned} \textcircled{5} \quad (x-5)^2 \\ (x-5)(x-5) \\ x^2 - 5x - 5x + 25 \\ \boxed{x^2 - 10x + 25} \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad (x+1)^2 \\ (x+1)(x+1) \\ x^2 + x + x + 1 \\ \boxed{x^2 + 2x + 1} \end{aligned}$$

$$\textcircled{10} \quad \frac{3(x+3)^{3/4}}{3} = \frac{81}{3}$$

$$\left((x+3)^{3/4} \right)^{4/3} = (27)^{4/3}$$

$$x+3 = 27^{4/3}$$

$$x+3 = \left(\sqrt[3]{27} \right)^4$$

$$\begin{array}{r} x+3 = 81 \\ -3 \quad -3 \end{array}$$

$$\boxed{x = 78}$$

$$\textcircled{8} \quad \left((x-2)^{2/3} \right)^{3/2} = (9)^{3/2}$$

$$x-2 = 9^{3/2}$$

$$x-2 = (\pm\sqrt{9})^3$$

$$x-2 = (3)^3 \text{ or } (-3)^3$$

$$\begin{array}{ccc} x-2 = 27 & \text{or} & -27 \\ +2 & +2 & +2 \end{array}$$

$$\boxed{x = 29 \text{ or } -25}$$

$$\begin{array}{c} -3 \cdot -3 \cdot -3 \\ \underbrace{\hspace{1cm}} \\ 9 \end{array}$$

$$\textcircled{6} \quad \sqrt{6-3x} - 2 = 0$$

$\begin{array}{ccc} & +2 & +2 \end{array}$

$$\left(\sqrt{6-3x}\right)^2 = (2)^2$$

$$\begin{array}{ccc} 6-3x & = & 4 \\ -6 & & -6 \end{array}$$

$$\frac{-3x}{-3} = \frac{-2}{-3}$$

$$\boxed{x = \frac{2}{3}}$$

$$\textcircled{9} \quad \frac{3(x-2)^{3/4}}{3} = \frac{24}{3}$$

$$\left((x-2)^{3/4}\right)^{4/3} = (8)^{4/3}$$

$$x-2 = (\sqrt[3]{8})^4$$

$$\begin{array}{ccc} x-2 & = & 16 \\ +2 & & +2 \end{array}$$

$$\boxed{x = 18}$$

$$\sqrt{x-3} + 5 = x$$

$\begin{matrix} -5 & -5 \end{matrix}$

$$(\sqrt{x-3})^2 = (x-5)^2$$

$$x-3 = x^2 - 10x + 25$$

$\begin{matrix} +3 & +3 \end{matrix}$

$$x = x^2 - 10x + 28$$

$\begin{matrix} -x & -x \end{matrix}$

$$0 = x^2 - 11x + 28$$

$$0 = (x-7)(x-4)$$

$$x = 7, 4$$

extraneous

Do these - Solve for x

$$\textcircled{1} \sqrt{5x-1} + 3 = x$$

$$\textcircled{2} (5x+4)^{\frac{1}{2}} - 3x = 0$$

$$\textcircled{3} \sqrt{x+7} + 5 = x$$

$$1. \quad \sqrt{5x-1} + 3 = x$$

$$\quad \quad \quad -3 \quad -3$$

$$\sqrt{5x-1} = x-3$$

$$5x-1 = x^2 - 3x - 3x + 9$$

$$5x-1 = x^2 - 6x + 9$$

$$\quad +1 \quad \quad \quad +1$$

$$5x = x^2 - 6x + 10$$

$$-5x \quad \quad -5x$$

$$0 = x^2 - 11x + 10$$

$$0 = (x-10)(x-1)$$

$$\boxed{x=10, 1} \quad 1 = \text{extraneous}$$

$$\textcircled{2} (5x+4)^{\frac{1}{2}} - 3x = 0$$

$$(5x+4)^{\frac{1}{2}} \overset{+3x}{=} \overset{+3x}{(0+3x)}^2$$

$$5x+4 = (0+3x)(0+3x)$$

$$5x+4 = 9x^2$$

$$\begin{array}{r} -4 \quad -4 \end{array}$$

$$5x = 9x^2 - 4$$

$$\begin{array}{r} -5x \quad -5x \end{array}$$

$$0 = 9x^2 - 5x - 4$$

$$\begin{array}{cc} 1 \cdot 9 & 11 \cdot 4 \\ 3 \cdot 3 & 2 \cdot 2 \end{array}$$

$$0 = (9x+4)(x-1)$$

$$9x+4=0$$

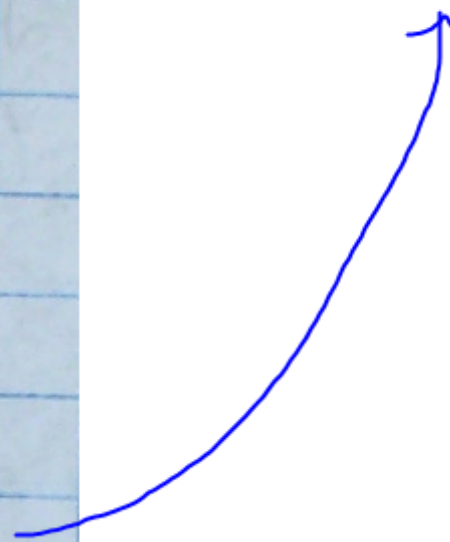
$$\begin{array}{r} -4 \quad -4 \end{array}$$

$$9x = -4$$

$$\frac{9x}{9} = \frac{-4}{9}$$

$$x = -\frac{4}{9}, 1$$

extraneous



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$$\sqrt{x+7} + 5 = x$$

$$\begin{array}{cc} -5 & -5 \end{array}$$

$$\sqrt{x+7} = (x-5)$$

$$x+7 = (x-5)^2$$

$$x+7 = x^2 - 10x + 25$$

$$\begin{array}{cc} -7 & -7 \end{array}$$

$$x = x^2 - 10x + 18$$

$$\begin{array}{cc} -x & -x \end{array}$$

$$0 = x^2 - 11x + 18$$

$$(x-9)(x-2)$$

$$x = 9, 2 \text{ ex.}$$

Sect. 7.5

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